IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A method, implemented on an apparatus configured to compensate motion prediction, of compensating motion prediction relative to each of a plurality of motion compensating blocks formed by dividing an objective frame image of successive frame images using a plurality of reference frame images, while sequentially changing pixel-based sizes of the plurality of motion compensating blocks, the method comprising:

thinning out, at the apparatus, pixels of a motion compensating block having a greatest pixel-based size to be taken as an uppermost layer of among blocks with smaller pixel-based sizes, each different pixel-based size of a block corresponding to a different layer of a frame image, to generate a size-reduced block in a lower layer having a predetermined size-reduction ratio;

determining, at the apparatus, motion vector search ranges respectively within the plurality of reference frame images based on a plurality of size-reduced reference images reduced in size corresponding to the size-reduction ratio of the size-reduced block by detecting motion vectors respectively within the plurality of size-reduced reference images and increasing a size of the motion vectors by linear interpolation to provide motion vector search ranges with respect to the plurality of reference frame images which correspond to an increased size of the motion vectors, wherein for each layer of a frame image except a lowermost layer, motion vectors are detected within a search range which includes a plurality of peripheral pixels in a rectangular range having apexes corresponding to start and end points of a motion vector detected in a lower layer; and

detecting, at the apparatus, an optimal motion vector while sequentially changing the pixel-based sizes of the plurality of motion compensating blocks, [[by]] using each of the

motion vector search ranges determined in the determining motion vector search ranges, by taking the motion compensating block having the greatest pixel-based size and performing a plurality of separate and independent sequences of incrementally dividing the motion compensating block having the greatest pixel-based size into smaller regions, and applying a size-reduced motion vector search range which is based on the motion vector search ranges to each of the smaller regions, each sequence dividing the motion compensating block having the greatest pixel-based size into different smaller regions than each of the other sequences and each of the sequences is performed substantially simultaneously to each other.

Claim 2 (Previously Presented): A method of compensating motion prediction according to claim 1, wherein the determining further includes determining the motion vector search ranges depending upon respective differences in pixel-based values from respective size-reduced reference images.

Claim 3 (Previously Presented): A method of compensating motion prediction according to claim 2, wherein the determining carries out block matching sequentially on the size-reduced reference images with the size-reduced block, so as to determine the motion vector search ranges on the basis of an absolute-value sum of a difference between a pixel-based value within the size-reduced block and a pixel-based value within a block corresponding to the size-reduced block within a predetermined size-reduced reference image.

Claim 4 (Previously Presented): A method of compensating motion prediction according to claim 3, wherein the determining further includes determining the motion vector search ranges depending upon an absolute-value sum of differences between a pixel value of

every other pixel with respect to a horizontal direction and a vertical direction of the size-reduced block and a pixel-based value within a corresponding portion of pixel-based values within the size-reduced block.

Claim 5 (Previously Presented): A method of compensating motion prediction according to claim 3, wherein the determining further includes determining as one of the motion vector search ranges a peripheral pixel range including an enlarged lower layer motion vector enlarged from a lower layer motion vector between a corresponding portion of pixels where an absolute-value sum of pixel-based values within the size-reduced block is minimum and the size-reduced block.

Claim 6 (Previously Presented): A method of compensating motion prediction according to claim 1, further comprising:

selecting only motion vector search ranges within the size-reduced reference images in which a difference of pixel-based values is minimized from the respective size-reduced blocks of among motion vector search ranges within the size-reduced reference images determined in the determining, wherein

the detecting further includes detecting an optimal motion vector by using only the motion vector search ranges within the size-reduced reference images selected in the selecting.

Claim 7 (Previously Presented): A method of compensating motion prediction according to claim 1, wherein:

the detecting an optimal motion vector further includes detecting the optimal motion vector depending on respective differences in pixel-based values between the size-reduced

block and the size-reduced reference images, a quantizing scale function, and a generation code amount for motion vector differences.

Claim 8 (Previously Presented): A method of compensating motion prediction according to claim 1, wherein the detecting an optimal motion vector further includes detecting an optimal motion vector based on a Rate Distortion optimization process.

Claim 9 (Canceled).

Claim 10 (Previously Presented): An apparatus for compensating motion prediction relative to each of a plurality of motion compensating blocks formed by dividing an objective frame image of successive frame images using a plurality of reference frame images, while sequentially changing pixel-based sizes of the plurality of motion compensating blocks, the apparatus comprising:

hierarchizing means for thinning out pixels of a motion compensating block having a greatest pixel-based size to be taken as an uppermost layer of among blocks with smaller pixel-based sizes, each different pixel-based size of a block corresponding to a different layer of a frame image, to generate a size-reduced block in a lower layer having a predetermined size-reduction ratio;

search range determining means for determining motion vector search ranges respectively within the plurality of reference frame images based on a plurality of size-reduced reference images reduced in size corresponding to the size-reduction ratio of the size-reduced block by detecting motion vectors respectively within the plurality of size-reduced reference images and increasing a size of the motion vectors by linear interpolation to produce motion vector search ranges with respect to the plurality of reference frame

images which correspond to an increased size of the motion vectors, wherein for each layer of a frame image except a lowermost layer, motion vectors are detected within a search range which includes a plurality of peripheral pixels in a rectangular range having apexes corresponding to start and end points of a motion vector detected in a lower layer; and

detecting means for detecting an optimal motion vector while sequentially changing the pixel-based sizes of the plurality of motion compensating blocks, [[by]] using the motion vector search ranges determined by the search range determining means, by taking the motion compensating block having the greatest pixel-based size and performing a plurality of separate and independent sequences of incrementally dividing the motion compensating block having the greatest pixel-based size into smaller regions, and applying a size-reduced motion vector search range which is based on the motion vector search ranges to each of the smaller regions, each sequence dividing the motion compensating block having the greatest pixel-based size into different smaller regions than each of the other sequences and each of the sequences is performed substantially simultaneously to each other.

Claim 11 (Currently Amended): An apparatus configured to compensate motion prediction relative to each of a plurality of motion compensating blocks formed by dividing an objective frame image of successive frame images using a plurality of reference frame images, while sequentially changing pixel-based sizes of the plurality of motion compensating blocks, the apparatus comprising:

a hierarchizing unit configured to thin out pixels of a motion compensating block having a greatest pixel-based size to be taken as an uppermost layer of among blocks with smaller pixel-based sizes, each different pixel-based size of a block corresponding to a different layer of a frame image, to generate a size-reduced block in a lower layer having a predetermined size-reduction ratio;

a search range determining unit configured to determine motion vector search ranges respectively within the plurality of reference frame images based on a plurality of size-reduced reference images reduced in size corresponding to the size-reduction ratio of the size-reduced block by detecting motion vectors respectively within the plurality of size-reduced reference images and increasing a size of the motion vectors by linear interpolation to produce motion vector search ranges with respect to the plurality of reference frame images which correspond to an increased size of the motion vectors, wherein for each layer of a frame image except a lowermost layer, motion vectors are detected within a search range which includes a plurality of peripheral pixels in a rectangular range having apexes corresponding to start and end points of a motion vector detected in a lower layer; and

a detecting unit configured to detect an optimal motion vector while sequentially changing the pixel-based sizes of the plurality of motion compensating blocks, [[by]] using the motion vector search ranges determined by the search range determining unit, by taking the motion compensating block having the greatest pixel-based size and performing a plurality of separate and independent sequences of incrementally dividing the motion compensating block having the greatest pixel-based size into smaller regions, and applying a size-reduced motion vector search range which is based on the motion vector search ranges to each of the smaller regions, each sequence dividing the motion compensating block having the greatest pixel-based size into different smaller regions than each of the other sequences and each of the sequences is performed substantially simultaneously to each other.